



PATENT

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Lisa D. Bronk

Appl No. : 09/775,315  
Applicant : Geun-Bae Kim, et al.  
Filed : February 1, 2001  
Title : POSITIVE ACTIVE MATERIAL FOR RECHARGEABLE LITHIUM BATTERY  
AND METHOD OF PREPARING SAME

TC/A.U. : 1745  
Examiner : Julian A. Mercado

Docket No. : 41671/DBP/Y35  
Customer No : 23363

## DECLARATION UNDER 37 CFR §1.132

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Post Office Box 7068  
Pasadena, CA 91109-7068  
Date: March 28, 2007

Commissioner:

I, Geun-Bae Kim, hereby declare that:

1. I received a bachelor's degree in engineering from Seoul National University in 1982, a master's degree in metallurgical engineering from Seoul National University in 1989 and a doctor's degree in metallurgical engineering from Seoul National University in 1994. I have been employed by Samsung SDI Co., Ltd. since 1994. My responsibilities include research in the area of lithium ion batteries, and I consider myself an expert on active materials for lithium ion batteries.

2. A lithium ion battery cell was fabricated in the same manner as set forth in Example 4 of the present specification at page 13, lines 4 to 17, except that the positive active material was prepared by mixing  $\text{LiMn}_2\text{O}_4$  and  $\text{Li}_{1.03}\text{Ni}_{0.8}\text{Mn}_{0.2}\text{O}_2$  in a weight ratio of 2/8.

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3. Another lithium ion battery cell was fabricated in the same manner as set forth in Example 4 of the present specification at page 13, lines 4 to 17, except that the positive active material was prepared by mixing  $\text{LiMn}_2\text{O}_4$  and  $\text{Li}_{1.03}\text{Ni}_{0.8}\text{Mn}_{0.2}\text{O}_2$  in a weight ratio of greater than 1, i.e., 6/4.

4. The lithium ion battery cell was charged and discharged according to the procedure set forth in the specification for examples 4 to 7 at page 14, line 23 to page 15, line 5. Namely, charge and discharge cycles were carried out once at 0.1C, three times at 0.2C, 10 times at 0.5C and 100 times at 1C between voltage limits of 4.3 and 3.0V. The discharge capacity of the lithium ion battery cell including the positive active material having a weight ratio of oxides of less than 1 was measured and the results are shown in the following table.

Ratio of Mn oxide to Ni-Mn oxide	Discharge capacity (mAh/g)
6/4	142
2/8	179

5. As can be seen from the table, the discharge capacity of the cell containing a positive active material according to the invention, i.e. having a weight ratio of oxides less than one, is superior to that of the cell containing a positive active material having a weight ratio of oxides greater than one. In my opinion, the superior results achieved using the inventive positive active material were unexpected.

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6. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date Mar. 27, 2007

By

Geun-Bae Kim

LES/ldb

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